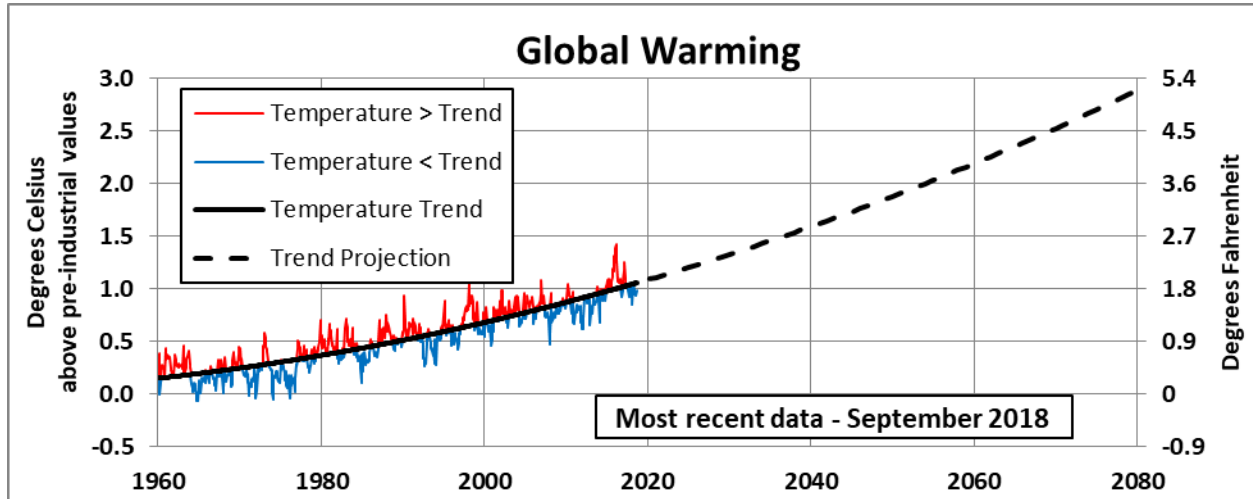


Global Warming Data, Trend and Projection
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Update Note –Global surface temperatures in September 2018 were slightly cooler than the trend but still the fifth warmest September on record. A mild La Niña condition has ended with Eastern Pacific sea surface temperatures becoming neutral. El Niño conditions are expected this coming fall and winter. Solar irradiance is approaching the minimum of its ≈ 11 year cycle, a cooling effect compared to recent years.

Data – Monthly global surface temperature anomaly data (red and blue lines) are monthly differences from the average temperature *for that month* during the years 1901-2000 and are available from [NOAA](http://www.noaa.gov). The red (blue) lines represent monthly temperatures warmer (cooler) than the trend. Note that $0.2\text{ }^{\circ}\text{C}$ has been added to the NOAA values to account for the difference between the 20th century average and pre-industrial values.

Trend and Projection — The trend shown in the chart is a quadratic fit to the recorded monthly global temperatures since 1960 relative to pre-industrial values. The projection is the continuation of this curve into future times. Note that the projection will change as the historical trend changes in response to new data. Recent temperatures are about half the $2.0\text{ }^{\circ}\text{C}$ target limit established by the Paris agreement. Based on the current projection, global temperatures will be $1.5\text{ }^{\circ}\text{C}$ above pre-industrial levels by 2036 and the Paris Agreement’s $+2.0\text{ }^{\circ}\text{C}$ target limit would be surpassed around 2053 (see chart.)